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Coccostromopsis palmicola on *Butia yatay* from Argentina

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Abstract — *Coccostromopsis palmicola* on living leaves of *Butia yatay* (*Arecaceae*) is reported for the first time from Argentina. This fungus is briefly described and illustrated. Some phytogeographical and phythopathological aspects are discussed.

Key words — *Ascomycota*, endangered palm, *Phyllachorales*, tar spots

Introduction

According to Hyde & Cannon (1999) the genus *Coccostromopsis* (*Phyllachorales*, *Phyllachoraceae*) was reintroduced for species on palms and bamboos having pulvinate, gelatinous, stromata with a yellowish sheen when young and strongly erumpent when mature, and with hyaline to yellow-brown or brown ascospores when mature. In respect to geographic distribution, species of *Coccostromopsis* are found wherever their palm hosts occur, i.e. mostly in tropical and subtropical regions (Blomberry & Rodd 1982). *Coccostromopsis* currently comprises five species. Hyde & Cannon (1999) provided a key to three of them, namely *C. diplothemii* (of which the type species, *C. palmigena,* is a synonym), *C. chamaedoreae,* and *C. palmicola.* These three species have been recorded from various countries of Central and South America. One additional species, *C. bambusae* (Sawada 1959), occurs on bamboo in China. Species of *Coccostromopsis* are considered tar spot fungi, because of the significant blackening of the surface layers of their ascomata (Hyde & Cannon 1999). The number of fungi associated with diseases of palm leaves is comparatively low, perhaps a reflection of the tough tissues of palms (Hyde & Cannon 1999). In Australia, Fröhlich (1993) identified 27 species associated with 14 palm species. Recently Capdet & Romero (2010) summarized previous information about fungi of palms and their occurrence in Argentina.

The purpose of this article is to communicate the presence of *Coccostromopsis palmicola* on living leaves of *Butia yatay* (Mart.) Becc. (*Arecaceae*) and to determine whether *C. palmicola* occurs on other palm species in Argentina.

Materials and methods

The sampling areas comprised parts of two national parks: Iguazú in Misiones Province and El Palmar in Entre Ríos Province (Fig. 1).

Iguazú National Park covers an area of 67,620 hectares (25°41'S, 54°18'W; APN 2008). This park is included in the "Paranaense province" (Cabrera & Willink 1980) of the Argentine phytogeographical regions. The climate is subtropical without a dry season. Annual rainfall averages vary between 1600 mm and 2000 mm and the annual average temperature is 20°C. The vegetation is subtropical forest and represents the highest animal and plant biodiversity in the country (Dirección de Bosques 2003). The two palms studied in this area were *Euterpe edulis* Mart. and *Syagrus romanzoffiana* (Cham.) Glassman. El Palmar National Park, covers an area of 8,500 hectares (31°55'S, 58°14'W) and was established in 1965 with the aim of preserving *Butia yatay*, an endangered species (Chebez 1994). It is included in the Argentine phytogeographical region called "Espinal province" (Cabrera & Willink 1980). The climate is warm and humid in the north, and temperate and dry in the west and south. Rainfall ranges from 400 mm to 1500 mm, mainly in spring and summer (Dirección de Bosques 2003). The vegetation includes savanna with palms, shrubs and gallery forest along the Uruguay River and grasslands. *Butia yatay*, the only palm present in the Park, has an endemic distribution in southern South America occurring in Argentina, Brazil, Paraguay and Uruguay.

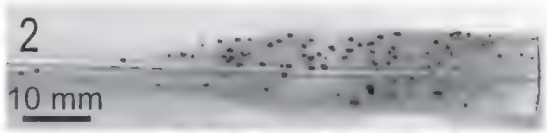
Intensive collecting was conducted in El Palmar National Park over the past three years (2007-2009). Living leaves of palm were collected in different seasons. The material was air-dried. Microscopic characters were observed in vivo using light microscopy. Sizes of all the structures were based on 20 measurements. Drawings were made with a camera lucida. Photographs were taken with a Sony Digital camera. The specimens are deposited in the BAFC fungal reference collection (Holmgren et al. 1990).

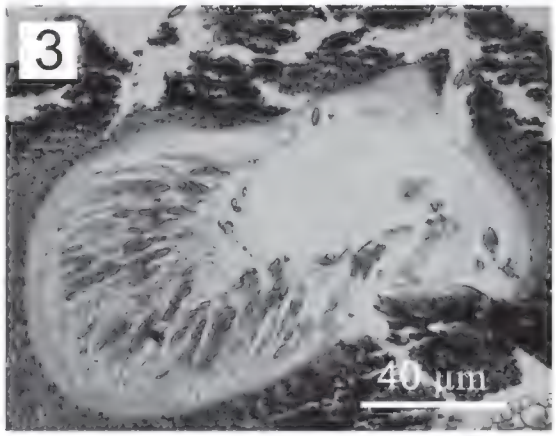
Results

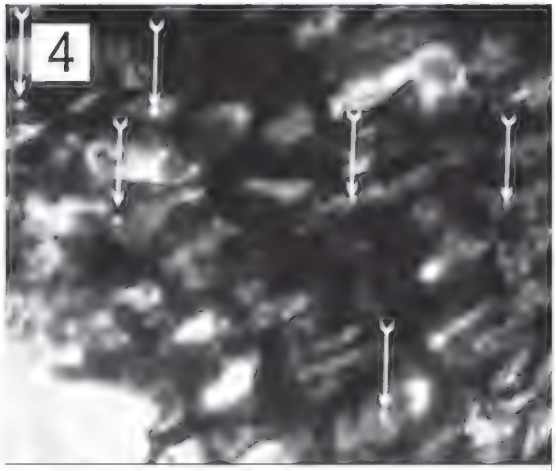
No specimens were found on *Euterpe edulis* or *Syagrus romanzoffiana* in Iguazú National Park. In contrast, most of the leaf pinnae of the palms trees observed of *Butia yatay* in the El Palmar National Park, Entre Ríos, had many stromata along the length of the leaflet.

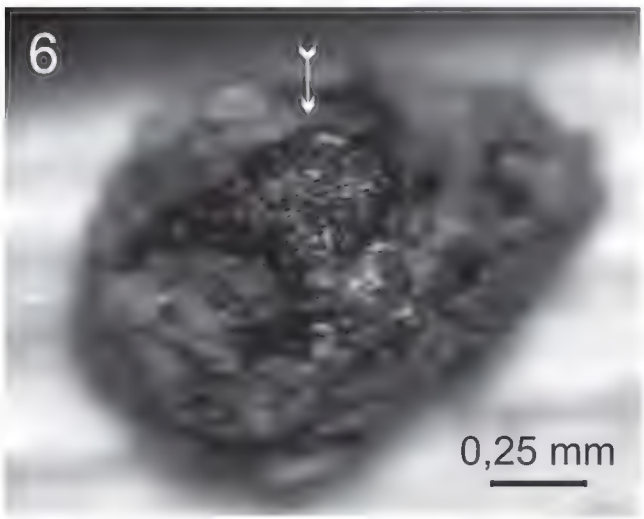
Figs 1–8. **1.** Sampling sites. **2.** Stromata on pinna of *Butia yatay*; scale bar = 10 mm. **3.** Longitudinal section through a perithecial ascoma; scale bar = 40 µm. **4.** Peridium cells with Munk pores; scale bar = 10 µm. **5.** Young stroma on host surface; scale bar = 0.25 mm. **6.** Teleomorphic stroma on leaf; arrow points to black ascospore mass; scale bar = 0.25 mm. **7.** Stroma with conidioma; arrow points to caramel brown conidial mass with cerebriform aspect; scale bar = 0.5 mm. **8.** Stroma with hyperparasitic conidioma; arrow points to translucent white cirrus; scale bar = 1 mm.

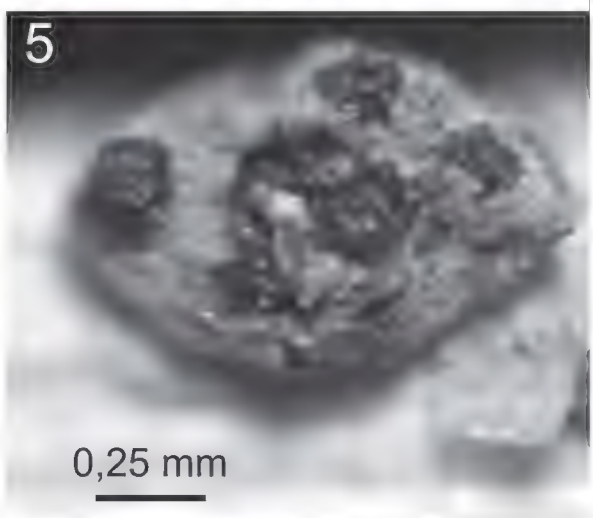
1
ASUNCIÓN
río Pilcomayo
río Bermejo
PARAGUAY
río Iguazú
Iguazú national park
río Paraná
BRASIL
río Paraná
río Uruguay
El Palmar national park
Argentina
URUGUAY
BUENOS AIRES


2
10 mm


3
40 µm


4


6
0,25 mm


5
0,25 mm

7

8
1 mm

Coccostromopsis palmicola (Speg.) K.D. Hyde & P.F. Cannon, Mycol. Pap. 175: 67, 1999. FIGS. 2–14

≡ *Auerswaldia palmicola* Speg., Anal. Soc. cient. argent. 19: 247, 1885. Type LPS 277!

ADDITIONAL SYNONYMY: see Hyde & Cannon (1999).

STROMATA 1.8–2.7 mm long, 1–1.6 mm wide, on living leaves, distributed along the veins, primarily on adaxial surface but also present on abaxial surface, with a sulphur-yellow patina when young, usually hemispherical or elongated, erumpent, verrucose, opaque black with shiny black areas formed by ascospore mass when mature. Cells of the stroma with Munk pores.

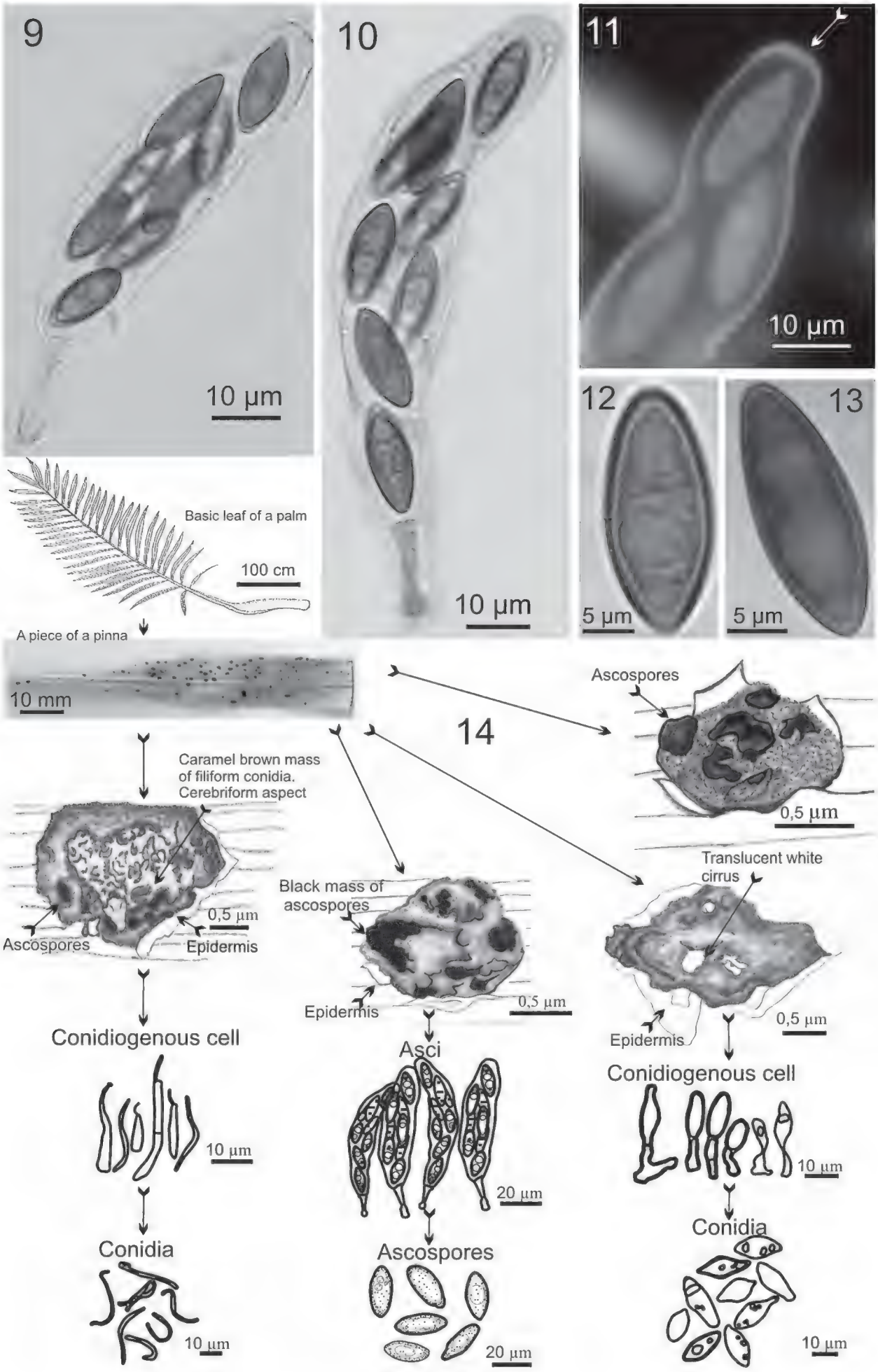
TELEOMORPH. ASCI cylindric-clavate, apex truncate, 8-spored, 120–155 × 16–25 µm, long-stalked, 35–45 µm long. ASCOSPORES 25–28 × 8–11 µm, arranged multiseriately, guttulate, aseptate, fusiform-ellipsoidal, mid brown, surrounded by a mucilaginous sheath. ANAMORPH. CONIDIOMATA formed locules in upper part of stroma, irregularly shaped. CONIDIOGENOUS CELLS in cluster on short branched conidiophores, cylindrical, enteroblastic. CONIDIA 14–31 × 1–2 µm, filiform, round towards both ends, often curved, aseptate, smooth, hyalines. Some of the stromata are parasitized by an anamorph producing conidiomata inside the stroma with a white cirrus consisting of fusiform to flabelliform conidia, 9–14 × 2–3 µm.

MATERIAL EXAMINED — **ARGENTINA. ENTRE RÍOS, DPTO. COLÓN:** EL PALMAR NATIONAL PARK, coll. Cabral, D., Iannone, L. & Pereira, S. 22.II.2007 (BAFC 51782), 22.II.2007 (BAFC 51783); 23.II.2007 (BAFC 51784); 24.II.2007 (BAFC 51780); coll. Capdet, M. & Romero, A.I. 22.IV.2008 (BAFC 51779); 23.IV.2008 (BAFC 51778); 24.IV.2008 (BAFC 51777); 18.VIII.2008 (BAFC 51785); 20.VIII.2008 (BAFC 51785); 02.II.2009 (BAFC 51781).

NOTES: This is the first record of *Coccostromopsis palmicola* on *Butia yatay* from Argentina. Spegazzini (1885) originally described this fungus on leaves of *Butia yatay* from Paraguay. Later Viégas (1944) reported it from Brazil on leaves of *Allagoptera arenaria* (Gomes) Kuntze. Although the collections from Paraguay and Brazil were collected in springtime, we have found it during all the seasons, although the summer collections were in the best condition. Of the 50 *Butia yatay* trees observed in different parts of the park, all were infected with *C. palmicola*.

Knowing that the fungus occurs in Brazil on other palm species, we also looked in Iguazú National Park close to the boundary with Brazil. *Butia yatay* is not present in Misiones province (Cabral & Castro 2007), but we examined two palms: *Euterpe edulis* and *Syagrus romanzoffiana* that grow in Brazil and Paraguay (Cabral & Castro 2007). *Coccostromopsis palmicola* was not found on these hosts. How can we explain its presence in Paraguay and Argentina

FIGS 9–14. **9–11.** Asci; arrow indicates apex details; scale bars = 10 µm. **12–13.** Ascospores; scale bars = 5 µm. **14.** General outlines of the different morphologies found on pinnae of *Butia yatay*.


9
10 µm
10
10 µm
11
10 µm
12
5 µm
13
5 µm
Basic leaf of a palm
100 cm
A piece of a pinna
10 mm
14
Caramel brown mass
of filiform conidia.
Cerebriform aspect
0,5 µm
Ascospores
Epidermis
Conidiogenous cell
10 µm
Conidia
10 µm
Black mass of
ascospores
Epidermis
0,5 µm
Asci
20 µm
Ascospores
20 µm
Ascospores
0,5 µm
Translucent white
cirrus
Epidermis
0,5 µm
Conidiogenous cell
10 µm
Conidia
10 µm

in El Palmar National Park? As observed in Fig. 1, in Argentina there are two main riverine systems: the Uruguay riverine system and the Paraguay-Paraná riverine system, which is a 3400 km long natural corridor through various ecosystems (tropical rain forest, savannas, steppes and brushlands) between 16 and 34° of south latitude (Neiff et al. 2005). The Uruguay system connects Brazil-Misiones to Entre Ríos provinces. The National Park of Entre Ríos is on the Uruguay side of the river side east of the province while the Paraná River is on the west side of the province. Therefore, the fact that Paraguay is connected through the Paraná River with the Entre Ríos province explains the presence of *C. palmicola* in both sites.

We cannot answer the question why *C. palmicola* is not in Misiones province, which shares the climate and most of the flora with Brazil and Paraguay. Although we did not find *C. palmicola* on *Euterpe edulis* and *Syagrus romanzoffiana,* we cannot say that the fungus is host specific on *Butia yatay* because in Brazil it is found on *Allagoptera arenaria* (Viégas 1944).

In our results we mentioned above that the stromata were parasitized by another anamorph. In his revision of *Phyllachoraceae,* Cannon (1991) noted that members of this family are among the most heavily parasitized fungi.

Acknowledgments

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